

Remarks/Arguments:

The present invention relates to a radio communication device and method. Specifically, radio communication devices are able to forward reservation and confirmation commands that are not addressed to the devices themselves.

On page 2, the Official Action rejects claims 1-5 and 14-19 under 35 U.S.C. § 103(a) as being unpatentable over Liu (U.S. Patent No. 7,103,371) in view of Mano (U.S. Patent No. 6,778,586) in view of Whitehall (U.S. Patent No. 6,768,730).

On page 8, the Official Action rejects claims 6-13 and 21-23 under 35 U.S.C. § 103(a) as being unpatentable over Liu in view of Mano in view of Whitehall further in view of Sugaya (U.S. 2004/0053621). It is respectfully submitted, however, that the claims are patentable over the art of record for the reasons set forth below.

Liu teaches a system for a reservation in a wireless network. Specifically, reservation information is utilized so that time slot collisions are avoided. Mano teaches a radio communication system where the system dynamically searches for a vacant time slot and then utilizes that time slot for transmission. Whitehill also teaches a wireless communication system. Specifically, Whitehill is able to send requests, messages and confirmation messages in order to avoid collisions in time slots. Furthermore, Sugaya teaches a radio communication system wherein buffer frames are utilized to ensure beacons do not collide.

Applicants' invention, as recited by claim 1, includes a feature which is neither disclosed nor suggested by the art of record; namely;

a step in which when the second radio communication device counts that the transmission prohibited time slot decided based on communication time reservation request information or communication time reservation response information or both which are not addressed to the second radio communication device overlaps with a time slot in which communication addressed to the second radio communication device is reserved, more than a predetermined number of times, the second radio communication device forwards communication time reservation request information and communication

time reservation response information which are not addressed to it and which are received from that time onward, to radio communication devices in the transmittable area.

Claim 1 relates to a procedure that counts the number of collisions that occur in a prohibited time slot. When the number of collisions in that prohibited time slot occur more than a predetermined number of times, the radio communication device forwards the reservation information to other communication devices in the area. Specifically, the reservation information that the device forwards is information that is not addressed to the device itself but rather addressed to other devices in the area. This feature is found on at least page 48 of the specification and furthermore, in Fig. 17. No new matter has been added.

On page 12 of the Official Action, the Examiner rejects claim 1 and specifically this feature based on Fig. 7A, 7B and col. 11, lines 20-34 of Liu. In col. 11, Liu teaches that a reservation table is updated in order for devices to avoid collisions ("*the reservation information is utilized to update a neighbor table ... the determined slot should avoid collision since the node has reservation information of neighboring nodes within two hops*"). Liu, however, does not suggest counting the number of collisions and comparing them to a predetermined value. Furthermore, Liu does not suggest that when a number of collisions exceed that predetermined value that request information is forwarded to other nodes. Also, Liu does not suggest forwarding request information that is not addressed to the communication device itself.

Applicants' claim 1 is different than Liu, because of the step of counting the number of transmissions in the prohibited time slot that overlap and thus collides with one another ("*a second radio communication device counts that the transmission prohibited time slot decided based on communication time reservation request information or communication time reservation response information or both which are not addressed to the second radio communication device overlaps with a time slot in which the communication addressed to the second radio communication device is reserved*"). Applicants' claim 1 is also different than Liu because if the collisions occur more than a predetermined number of times, the radio communication device forwards reservation information that is not addressed to the communication device itself

("more than a predetermined number of times, a second radio communication device forwards communication time reservation request information and communication time reservation response information which are not addressed to it and which are received from that time onward, to radio communication devices in the transmittable area"). In Fig. 1, Applicants show a network with four devices A, B, C and D. During communication, device B is able to receive the request information from device A even though the request information may not be addressed to terminal B (it may be addressed to another device other than B). Terminals C and D, however, are out of the communication range of terminal A and thus do not receive any reservation information regardless of who the information is addressed to. Thus, there is a possibility that terminals C and D will attempt to communicate in the prohibited time slot (they do not know that the time slot is prohibited). Thus, when collisions occur, Terminal B counts the number of collisions and compares them to a predetermined value. When a number of collisions exceed a predetermined value, terminal B then forwards the request information that it received from terminal A to both terminals C and D. The reservation information that terminal B forwards to both terminals C and D is reservation information which was not addressed to terminal B. Therefore, the terminals in the network are able to forward reservation information to other neighboring devices even though the reservation information is not addressed to the device itself (it just forwards the information). This feature is supported on page 48, paragraph 150 of the specification *("when the collision frequency is high, the radio communication device according to the embodiment forwards a received RTS signal not addressed to it in the communicable area ... when the radio communication device 102 receives the RTS signal from the radio communication device 103, the radio communication device 102 forwards the RTS signal to the radio communication device 101")*. An advantage of this feature as recited in claim 1 is the ability for other communication terminals to avoid collisions. Accordingly, for the reasons set forth above, claim 1 is patentable over the art of record.

Claim 14 has been similarly amended to claim 1. Thus, claim 14 is also patentable over the art of record for the reasons set forth above.

Applicants' invention, as recited by claim 12, includes a feature which is neither disclosed nor suggested by the art of record, namely:

wherein when the number of detected collisions is less than the prescribed number, the second radio communication device stops giving notice of its transmission prohibited time slots or its transmission-permitted time slot.

Claim 12 relates to a step wherein a number of collisions that are counted is compared to a predetermined value. If the number of collisions are less than the predetermined value, the communication device stops transmission notice of the prohibited time slot. This feature is at least supported on paragraphs 140 and 143 of the specification, and furthermore, in Fig. 16. No new matter has been added.

On page 13, the Official Action rejects claim 12 based on paragraphs 40 and 81 and also Fig. 10 of Sugaya. In paragraphs 40, 41 and 80, Sugaya teaches that the buffer frame period is to be made shorter in order to help avoid collision (*"setting device or step may set a buffer frame period that is shorter than a normal transmission frame period to ease collision of beacon information ... make fine adjustment of a transmission frame period of a local network thereby to implement coexistence of a plurality of wireless networks on the same frequency"*). Therefore, Sugaya only teaches that the buffer frame period is shortened. Sugaya, however, does not teach stopping the notice of transmission prohibited time slots when the collisions are counted to be less than a predetermined number.

Applicants' claim 12 is different than Sugaya because the system is able to compare the detected number of collisions to a prescribed number. When the detected number of collisions are less than the predetermined number, the radio device stops giving notice of the transmission prohibited time slots (*"wherein the number of detected collisions is less than a prescribed number, the second radio communication device stops giving notice of its transmission prohibited time slots or its transmission-permitted time slot"*). This feature is supported in at least paragraph 140 (*"the source radio communication device does not inquire as to the communication-prohibited time slot if not necessary, and therefore the source destination radio communication devices do not have to perform unnecessary transmission of information"*). This feature is also supported in paragraph 143 where it is discussed that the collision frequency is decreasing (*"in the case that the collision frequency decreases, the radio communication device does not respond to the source*

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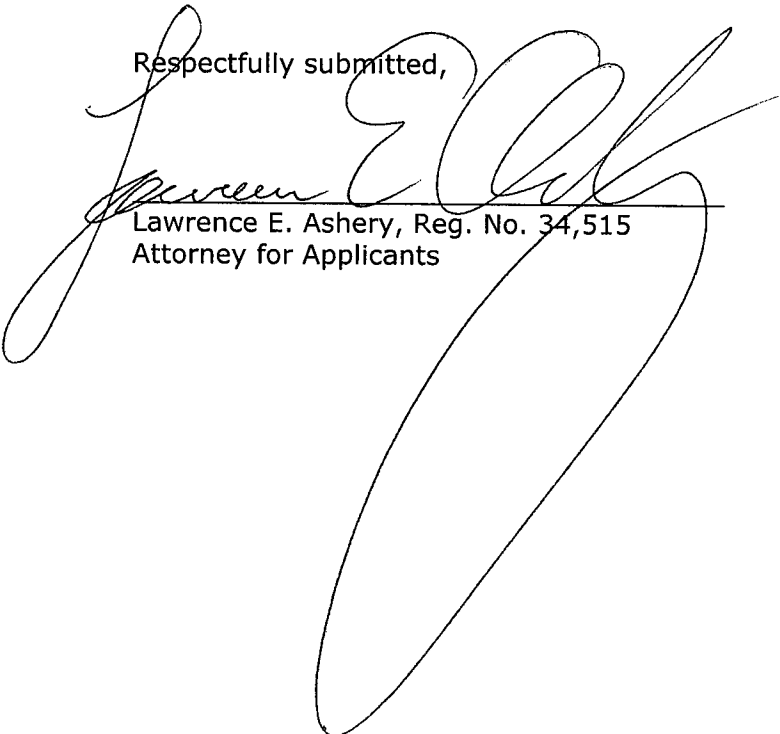
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radio communication device with the notification of collision and non-permission of communication again. Therefore, it is possible that under conditions where the collision frequency is low and there is no interference for continuing communication, the communication continues, and the operation of redesignated time slot in order to avoid collision is performed only in the case where the collision frequency increases"). An advantage to not transmitting the collision information when collision frequency is low, is that excessive information being transmitted can be avoided. Accordingly, for the reasons set forth above, claim 12 is patentable over the art of record.

Claims 2-8, 10, 11, 13 and 15-23 include all of the features of the claims from which they depend. Thus, these claims are also patentable over the art of record for the reasons set forth above.

In view of the amendments and arguments set forth above, the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,


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